No. 817,864. PATENTED APR. 17, 1906.

S. P. MITCHELL.

DERRICK CAR.

APPLICATION FILED MAY 2, 1905.

4 SHEETS—SHEET 1.

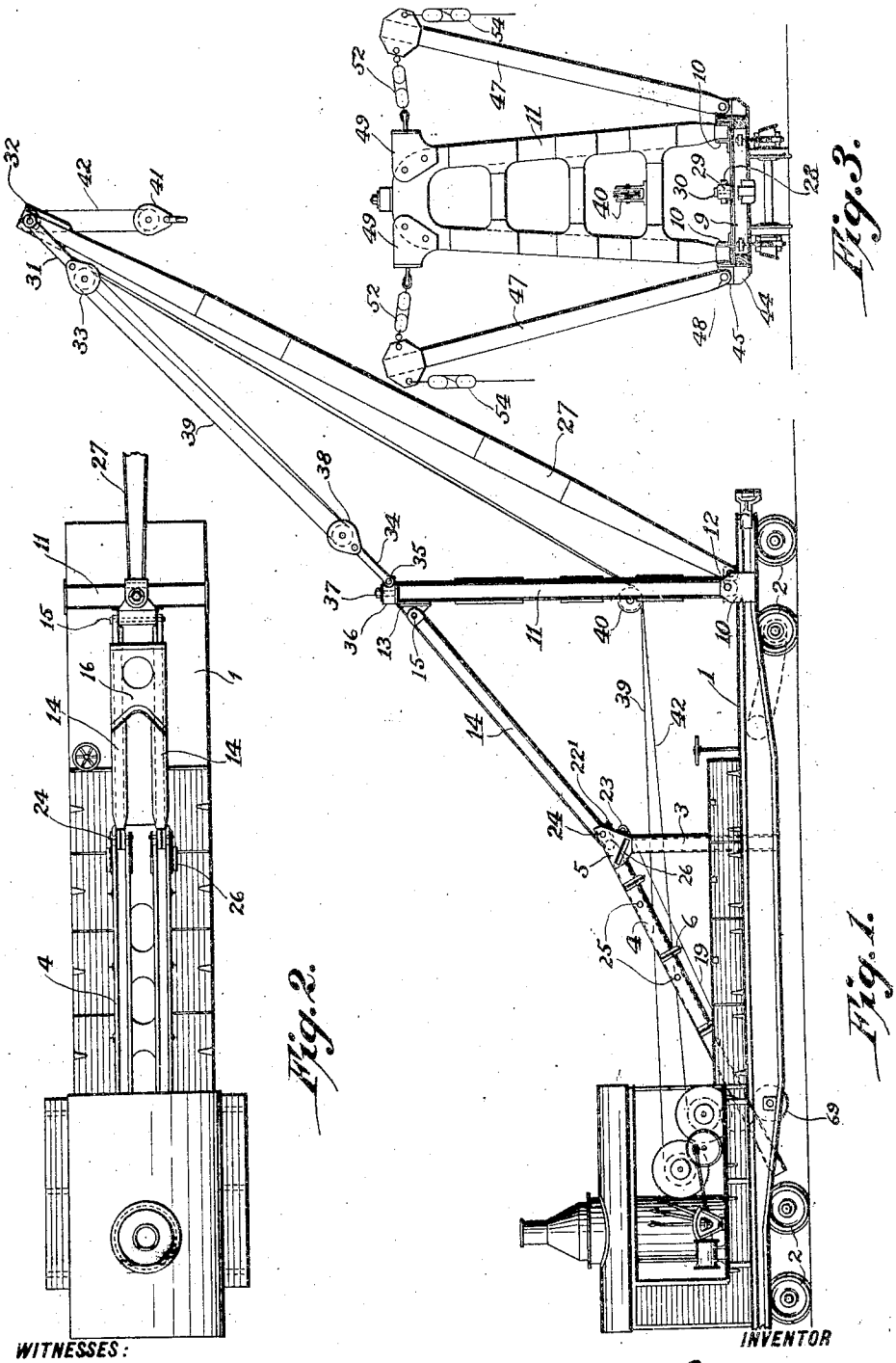


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:

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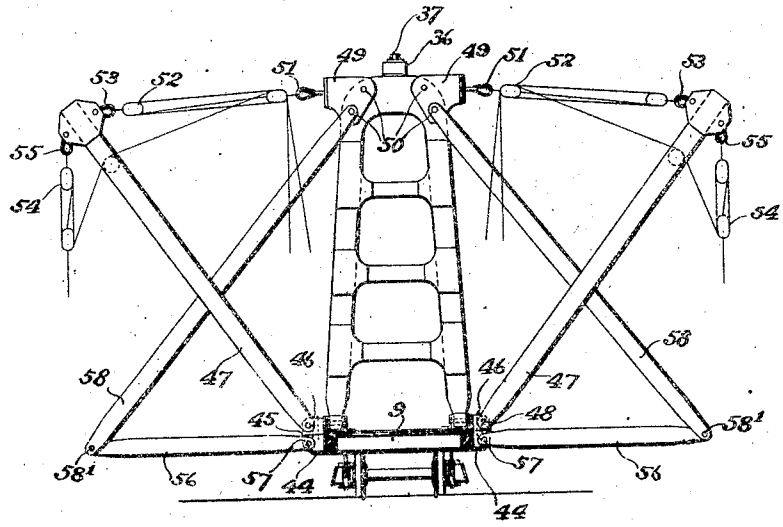


Fig. 4.

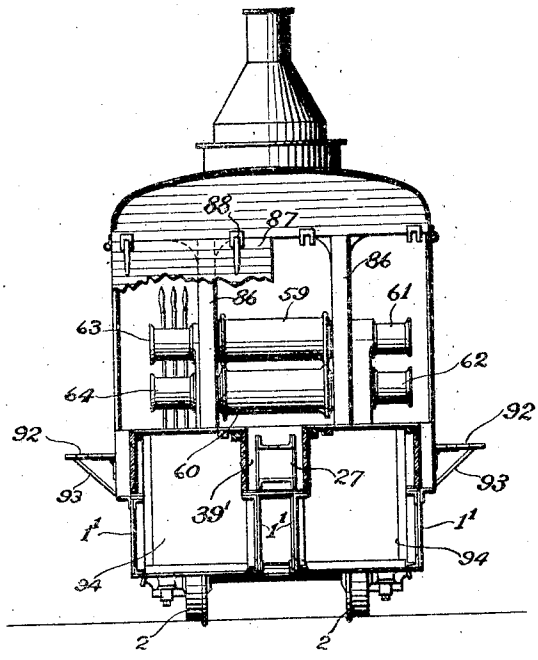


Fig. 5.

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4 SHEETS—SHEET 3.

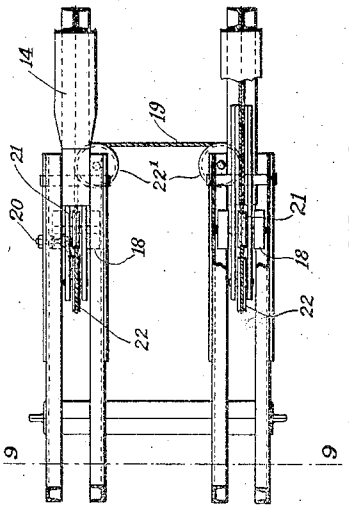


Fig. 8.

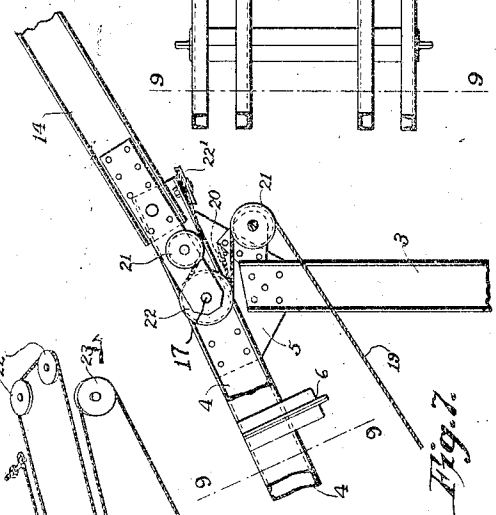


Fig. 7.

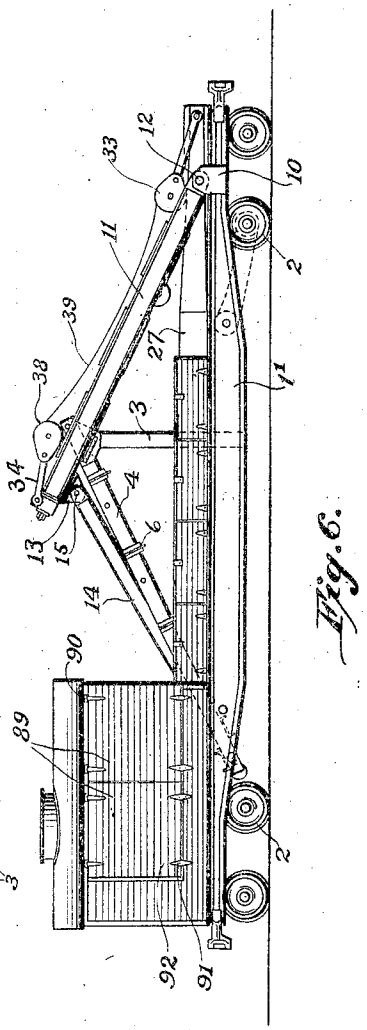


Fig. 6.

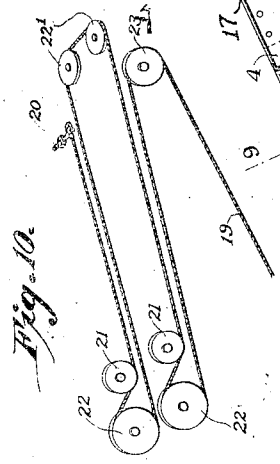


Fig. 10.

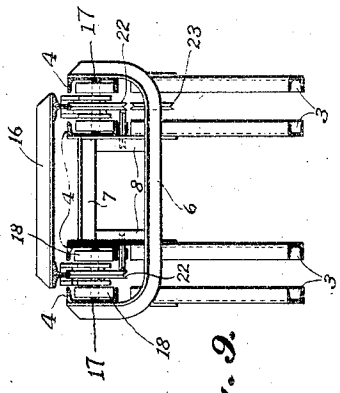


Fig. 9.

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DERRICK CAR.

APPLICATION FILED MAY 2, 1905.

4 SHEETS—SHEET 4.

Fig. 12.

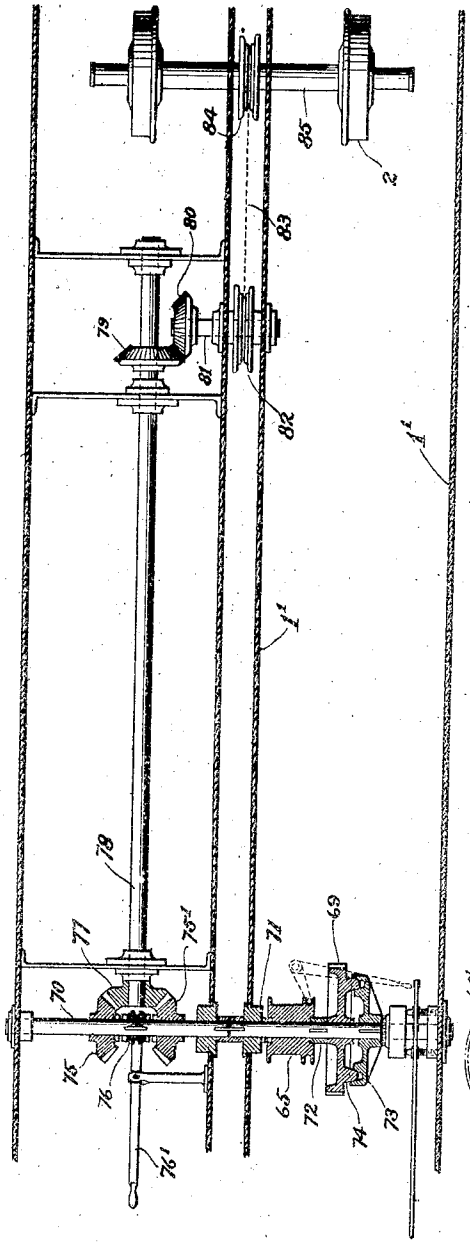
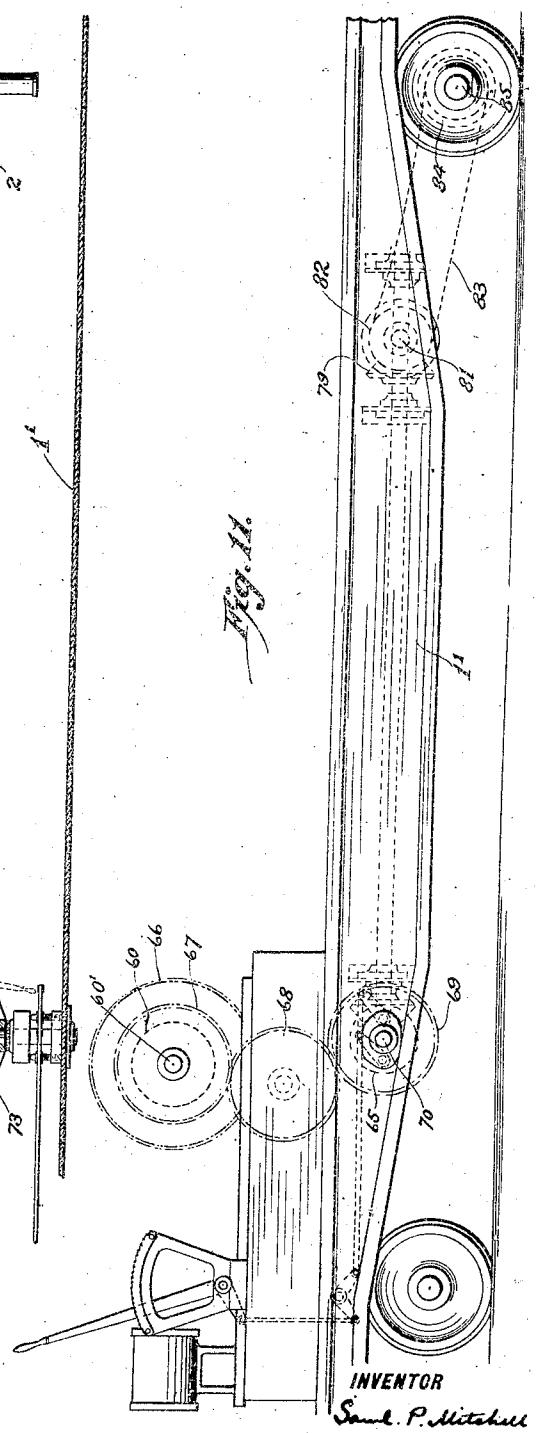


Fig. 11.



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UNITED STATES PATENT OFFICE.

SAMUEL P. MITCHELL, OF PHILADELPHIA, PENNSYLVANIA.

DERRICK-CAR.

No. 817,864. Specification of Letters Patent. Patented April 17, 1906.

Application filed May 2, 1905. Serial No. 258,540.

To all whom it may concern:

Be it known that I, SAMUEL P. MITCHELL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Derrick-Cars, of which the following is a specification.

This invention is an improved derrick-car, having as its objects to handle in the most economical manner heavier loads at longer reaches than heretofore; to handle heavy loads on either side of the car and to provide a safe means of side anchorage or counterbalance therefor; to provide for the ready propulsion of the car and the transportation of the derrick's load from place to place; to permit the parts that stand above train clearance to be readily knocked down for shipment and set up by power for operation in the least possible time; to provide suitable storage capacity upon the car for the entire equipment required, and to produce a structure attaining these ends at a reasonable cost.

In the accompanying drawings, Figure 1 represents a side elevation of a derrick-car embodying the improvements. Fig. 2 represents a plan view of the same with the main boom broken away. Fig. 3 represents a front elevation of the A-frame mast and a section of the car with lateral booms attached thereto. Fig. 4 represents a front elevation of the A-frame mast and a section of the car with lateral booms and outriggers attached thereto. Fig. 5 represents a vertical section through the body of the car, showing a front elevation of the cab with the engine therein. Fig. 6 is a side elevation of the car with the derrick knocked down and stored. Fig. 7 is a sectional side elevation showing the connections between the movable backstay for the A-frame and the fixed backstay for holding it. Fig. 8 is a plan view of parts shown in Fig. 7. Fig. 9 is a sectional view taken on the lines 9 9 of Figs. 7 and 8. Fig. 10 is a diagrammatic view of the cable and sheaves for handling the movable backstay. Fig. 11 is a side elevation of the car and the propelling mechanism, and Fig. 12 is a sectional plan view of the same.

In the apparatus the car-body 1 comprises the sills 1', carried by the trucks 2. Vertical channels 3 and inclined channels 4, arranged in pairs, are fixed at their lower ends to the car-body and are fixed together at their upper ends by gusset-plates 5 to form fixed stays. The flanges of the respective pairs of inclined channels are disposed toward each other to form guideways, and the several parts of the ways are braced by the bent angles 6, secured to the outer channels, and the braces 7, supported by the members 8, secured to the inner channels and carried by the bent angles.

The bolster 9 has the bearings 10 thereon, to which the feet of the A-frame mast 11 are fulcrumed by pins 12. A bearing 13, fixed to the top of the mast, has the movable backstays 14 fulcrumed thereto by a pin 15, these stays being connected together by the bracing 16. The lower end of each of the stays 14 has a spindle 17 passed therethrough, which carries rollers 18, running in the ways formed by the inclined channels. A cable or line 19 is connected to a becket 20, fixed to one of the fixed backstays, and passes under an idler-sheave 21 and over a main sheave 22, journaled in the lower end of one of the movable stays, thence over the sheaves 22', journaled at the top of one of the fixed stays, thence over an idler-sheave 21 and main sheave 22, journaled in the lower end of the second movable stay, thence over the sheave 23, journaled at the top of the second fixed stay, and thence to the engine, by which the mast may be lowered and elevated. In the usual operation the mast is held in the vertical position by passing a pin 24 through the head of the fixed stays and the foot of the movable stays; but the mast may be held at various elevations by pinning through holes 25 at various points along the inclined ways, and it is supported in its lowered position by brackets 26 on the head of the fixed stays.

The main boom 27 has its foot fulcrumed on the trunnions 28 of a trunnion-block 29, the latter being fulcrumed on the bolster by a pin 30. The top of the boom has a bail 31, fulcrumed thereon by a pin 32 and connected to a sheave-block 33. A bail 34 is fulcrumed by a pin 35 to a trunnion-block 36, which is fulcrumed on the top of the mast by a pin 37. A sheave-block 38, supported by the bail 34, is connected to the sheave-block 33 by a line 39, which passes through the sheave-block 40 on the mast to the engine, by which the main boom is raised and lowered, the lifting-block 41, carried by a line 42, passing over a sheave 43 on the outer end of the boom and thence through the sheave-block 40 to the engine.

When the boom is lowered and supported

at its outer end, it is readily disconnected from the bolster by drawing the pin 30 and stowed in the boom-chamber 39', and when the mast is lowered the sheave-blocks lie upon the mast and the movable stays extend along the fixed stays. (See Fig. 6.)

Bearings 44 are secured to the outer ends of the bolster 9 and support the trunnion-blocks 45, which are fulcrumed thereon by pins 46, the blocks providing bearings for the lateral booms 47, fulcrumed thereon by pins 48. The mast has the brackets 49, connected to the head thereon by pins 50, the brackets having the eyes 51 connected therewith for the attachment of the topping-falls 52, which are connected to eyes 53, carried by the tops of the lateral booms, the lines extending to the engine by which these booms are raised and lowered. The lifting-falls 54, supported by the eyes 55, attached to the outer ends of the lateral booms, have their lines connected with the engine, by which a load can be handled on either side of the car. It will be understood that each lateral boom may be used to provide a counterbalance for the load handled by the other.

To give stability to the structure in the operation of the booms, outriggers are provided consisting of the lateral braces 56, connected by pins 57 to the bearings 44, and the inclined braces 58, connected by pins 58' with the braces 56 and by the pins 50 with the top of the mast, the ends of the outriggers being blocked up and anchored to resist all tendency to tipping the structure when this is required by the work in hand.

The engine, having the usual drums 59 and 60 and spools 61, 62, 63, and 64 for holding the lines connected with the booms, is provided with the drum 65 for handling the line which operates the movable stays. The shaft 60', which carries the drum 60, is revolved in the usual manner by the gear 66 and has a gear 67, fixed thereto, which engages an idler-gear 68. The idler-gear engages a gear 69, loose on the shaft 70, journaled in the car-body, on which the drum 65 is loosely mounted. This drum is adapted to be shifted by conventional mechanism longitudinally on the shaft into engagement with the fixed clutch 71 for holding it against idling revolution and into engagement with the clutch 72, fixed to the shaft 70, for revolving it therewith. The shaft is revolved by fixing the gear-wheel 69 thereto by means of a clutch-disk 73, splined to the shaft, so as to be held against rotation and movable by any usual mechanism into engagement with the clutch-ring 74 on the gear.

The car is propelled from the shaft 70 in opposite directions by bevel-gears 75, normally loose thereon and adapted to be fixed thereto in alternation by a clutch 76. This clutch is splined on the shaft, so as to be held against revolution thereon and movable longitudinally, as by the lever 76', into clutching engagement with either bevel-gear, the clutch being disengaged from each of said gears when disposed centrally between them. The gears 75 engage a bevel-gear 77, fixed on a shaft 78, journaled in the car-body, this shaft having a bevel-gear 79 thereon, which engages a bevel-gear 80, fixed on the shaft 81, and drives a chain 83, passing over a sprocket 84, fixed to a car-axle 85.

The engine is disposed in a cab, having its roof supported in front by posts 86, set in between the drums and spools, so that the lines to the drums pass between the posts and the lines to the spools pass outside. The front of the cab is provided with doors 87, connected by hinges 88 to the top of the cab, so that the front can be closed by dropping the doors and opened by elevating or removing them. The sides are closed by doors 89, connected by hinges 90 to the top of the cab, and doors 92, connected to the bottoms by hinges 91, the sides being opened by elevating or removing the doors 89 and dropping the doors 92, the latter being supported in the horizontal position by struts 93 to provide an extended floor for the engineer. There is thus provided an engine wholly within the cab and capable of being readily inclosed, while the special construction provides room and freedom of movement in operating the engine. The cab thus constructed with the boom-chamber and the tool-boxes 94 provide means for storing the entire equipment.

Having described my invention, I claim—

1. In a derrick-car, a fulcrumed mast, a movable stay fulcrumed to said mast, and a fixed stay providing an inclined way with which said movable stay is connected, said parts being constructed to permit said mast to be lowered and supported by said fixed stay independently of said movable stay.

2. In a derrick-car, a fulcrumed mast, a fulcrumed boom connected to said mast, a movable stay fulcrumed to said mast, a fixed stay providing an inclined way, and mechanism connecting said movable stay with said inclined way.

3. In a derrick-car, a car-body, an A-frame mast fulcrumed on said car-body, a boom fulcrumed on said car-body and connected to said mast, fixed stays having inclined members carried by said car-body, and movable stays fulcrumed to said mast and supported by said fixed stays.

4. In a derrick-car, a car-body, a mast having a plurality of upright members fulcrumed on said car-body, a boom fulcrumed on said car-body and connected to said mast, a movable stay connected to said mast, and a fixed stay having an inclined member carried by said car-body and engaging said movable stay, said fixed stay having means for engaging and holding said mast.

5. In a derrick-car, a car-body, a mast

having a plurality of upright members fulcrumed on said car-body, a boom fulcrumed on said car-body and connected to said mast, a movable stay fulcrumed to said mast, a fixed stay having an inclined member carried by said car-body, said inclined member comprising channels forming a way and said stay having a roller thereon movable in said way, a motor, and mechanism whereby said motor operates said movable stay to elevate and lower said mast.

6. In a derrick-car, a car-body, a mast fulcrumed on said body, a main boom fulcrumed on said body, block-and-tackle mechanism connecting said mast and boom, a lateral boom fulcrumed on said body, a bracket secured to said mast, block-and-tackle mechanism for connecting said lateral boom and bracket, a motor on said car for operating the block-and-tackle mechanism of said booms, and an outrigger for balancing said mechanism.

7. In a derrick-car, a car-body, a mast fulcrumed on said body, a main boom fulcrumed on said body, lateral booms fulcrumed on said body, and outriggers, said outriggers comprising an inclined brace directly connected to the top of said mast, and a laterally-extending brace connected to said inclined brace and body.

8. In a derrick-car, a car-body, an A-frame mast fulcrumed on said body, a movable stay fulcrumed to said mast and having a roller thereon, a fixed stay having members comprising channels forming an inclined way in which said roller moves, means for engaging said movable stay and holding said mast at various elevations, a motor, a line operated by said motor, and sheaves carried by said movable and fixed stays for engaging said line and handling said movable stay and mast.

9. In a derrick-car, a car-body, a mast supported by said body, a main boom supported by said body, a block-and-tackle mechanism connecting said mast and boom, lateral booms supported by said body, block-and-tackle mechanisms connecting said mast and lateral booms, an engine having a central drum for operating the main boom-tackle mechanism and lateral spools for operating the lateral boom-tackle mechanism, and a cab for inclosing said engine, said cab having posts set between said drum and spools.

10. In a derrick-car, a car-body having longitudinally-extending tool-chambers on either side thereof, a boom-chamber between said tool-chambers, an engine, and a cab for inclosing said engine, said cab having folding doors providing footways on the sides thereof.

11. In a derrick-car, a car-body having longitudinally-extending tool-chambers on the sides thereof, a boom-chamber between said tool-chambers, an engine having central drums and lateral spools, and a cab containing said engine, said cab having roof-supporting posts disposed in the planes between said drums and spools and side doors adapted for use as footways.

12. In a derrick-car, a car-body, a mast having a fulcrumed connection with said car-body, a main boom having a fulcrumed connection with said car-body and connected to said mast, a lateral boom having a fulcrumed connection with said car-body and connected to said mast, a movable stay connected to said mast, and an inclined stationary stay connected to said car-body, said movable stay being connected to and supported by said stationary stay.

In testimony whereof I have hereunto set my hand, this 24th day of April, 1905, in the presence of the subscribing witnesses.

SAMUEL P. MITCHELL.

Witnesses:
UTLEY E. CRANE, Jr.,
LOUIS H. BUEK.